

CLAIMS

We claim:

1. A vehicle suspension assembly, comprising:

a first support member attached to a body of the vehicle;

a second support member that moves relative to the first support member;

at least one air spring coupled with the first and second support members; and

a jounce bumper within the air spring having a first portion supported relative to the first support member and a second portion supported to move with the second support member, the jounce bumper portions each including a surface configuration that maintains a first minimal spacing between the support members when the first and second portions are in a first alignment position, and maintains a second spacing between the support members when the first and second portions are in a second alignment position.

2. The assembly of claim 1, wherein the surface configuration includes at least one projection on each jounce bumper portions and wherein the projections do not contact each other when the first and second portions are in the first alignment position.

3. The assembly of claim 2, wherein the projections on the first portion are positioned to contact each other when the first and second portions are in the second alignment position.

4. The assembly of claim 2, wherein the projections comprise wedge shaped pieces that extend in an axial direction and are circumferentially spaced about the bumper portions, respectively.

5. The assembly of claim 4, wherein the projections are interdigitated with spaces between the projections and wherein the projections on the first portion are aligned with the spaces on the second portion when the bumper portions are in the first alignment position.

6. The assembly of claim 1, wherein the jounce bumper portions surface configurations each include a sloped surface and wherein the sloped surfaces are in a generally parallel alignment when the jounce bumper portions are in the first alignment position.

7. The assembly of claim 1, including an actuator that is operative to selectively move at least one of the jounce bumper portions to selectively move the portions into the first or second alignment position.

8. The assembly of claim 7, wherein the actuator is a hydraulically powered rotary actuator that rotates at least one of the jounce bumper portions.

9. The assembly of claim 8, including an air source that is supported on the vehicle and is operative to control the application of a parking brake on the vehicle and wherein the air source provides a control signal to the actuator that is indicative of a desired alignment of the bumper portions.

10. An air spring assembly, comprising:
 - a bead plate that is adapted to be supported on a first portion of a vehicle suspension;
 - a retainer plate that is adapted to be supported on a second portion of the vehicle suspension, which is moveable relative to the first suspension portion;
 - a first bumper portion supported on the bead plate and having a first surface configuration;
 - a second bumper portion supported on the retainer plate and having a second surface configuration; and
 - wherein the bumper portions are selectively aligned such that the surface configurations on the bumper portions selectively maintain a desired spacing between the bead plate and the retainer plate.
11. The assembly of claim 10, wherein a first spacing is maintained when the first and second bumper portions are in a first alignment position, and a second spacing is maintained when the first and second bumper portions are in a second alignment position.
12. The assembly of claim 11, wherein the first surface configuration includes at least one projection that extends in a direction toward the retainer plate and the second surface configuration includes at least one projection that extends toward the bead plate.
13. The assembly of claim 11, wherein the projection on the first portion is positioned to contact the projection on the second portion when the first and second portions are in the second alignment position.
14. The assembly of claim 10, including an actuator that is operative to selectively move at least one of the jounce bumper portions to selectively align the portions.

15. The assembly of claim 10, wherein the first surface configuration includes a sloped surface and the second surface configuration includes a sloped surface and wherein at least a portion of one of the sloped surfaces is positioned to contact at least a portion of the other sloped surface to maintain the desired spacing between the bead plate and the retainer plate.

16. The assembly of claim 10, wherein the surface configurations each include projections that comprise wedge shaped pieces that extend in an axial direction and are circumferentially spaced about the bumper portions, respectively.

17. The assembly of claim 16, wherein the projections are interdigitated with spaces between the projections and wherein the projections on the first portion are aligned with the spaces on the second portion when the bumper portions are in a first alignment position and the projections on the first portion are aligned with the projections on the second portion when the bumper portions are in a second alignment position.

18. A jounce bumper for use in a vehicle suspension, comprising:
a first portion having a first surface configuration; and
a second portion having a second surface configuration that cooperates
with the first surface configuration so that a total thickness of the first and second
portions is selectively varied depending on the alignment between the first and second
portions.
19. The jounce bumper of claim 18, wherein the first surface configuration
includes at least one projection extending toward the second portion and wherein the
second surface configuration includes at least one projection extending toward the
first portion.
20. The jounce bumper of claim 19, wherein the first surface configuration
includes a plurality of projections interdigitated with a plurality of recesses and the
second surface configuration includes a corresponding plurality of projections
interdigitated with a plurality of recesses and wherein the recesses on each portion are
sized to selectively receive the projections on the other portion.
21. The jounce bumper of claim 18, wherein each portion is at least
partially wedge shaped so that the first and second surface configurations include
cooperating sloped surfaces.